



# Marine Fisheries Management in North Carolina

**Marine Fisheries  
Study Committee**

**Jan. 5, 2012**



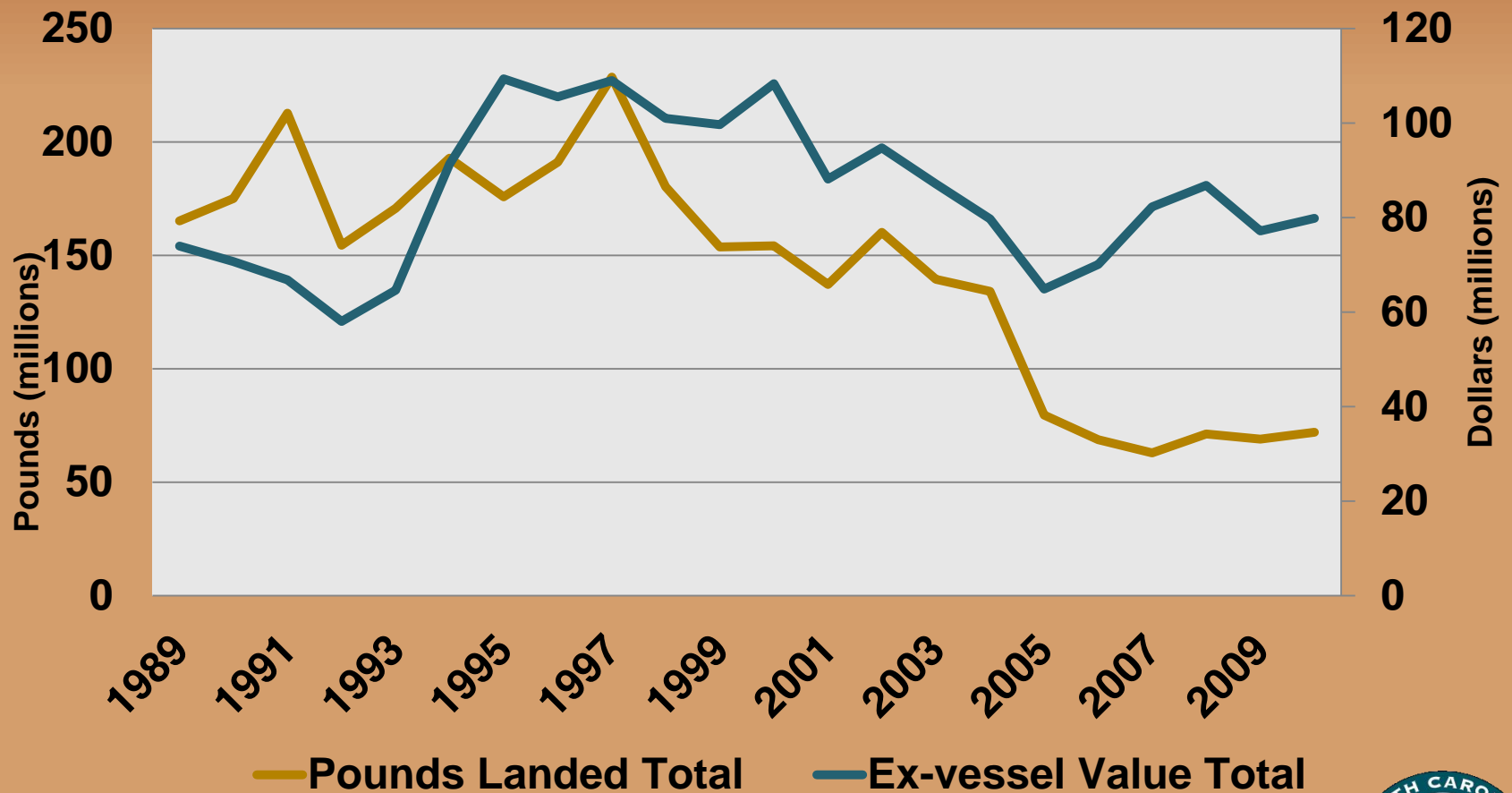


# North Carolina Facts

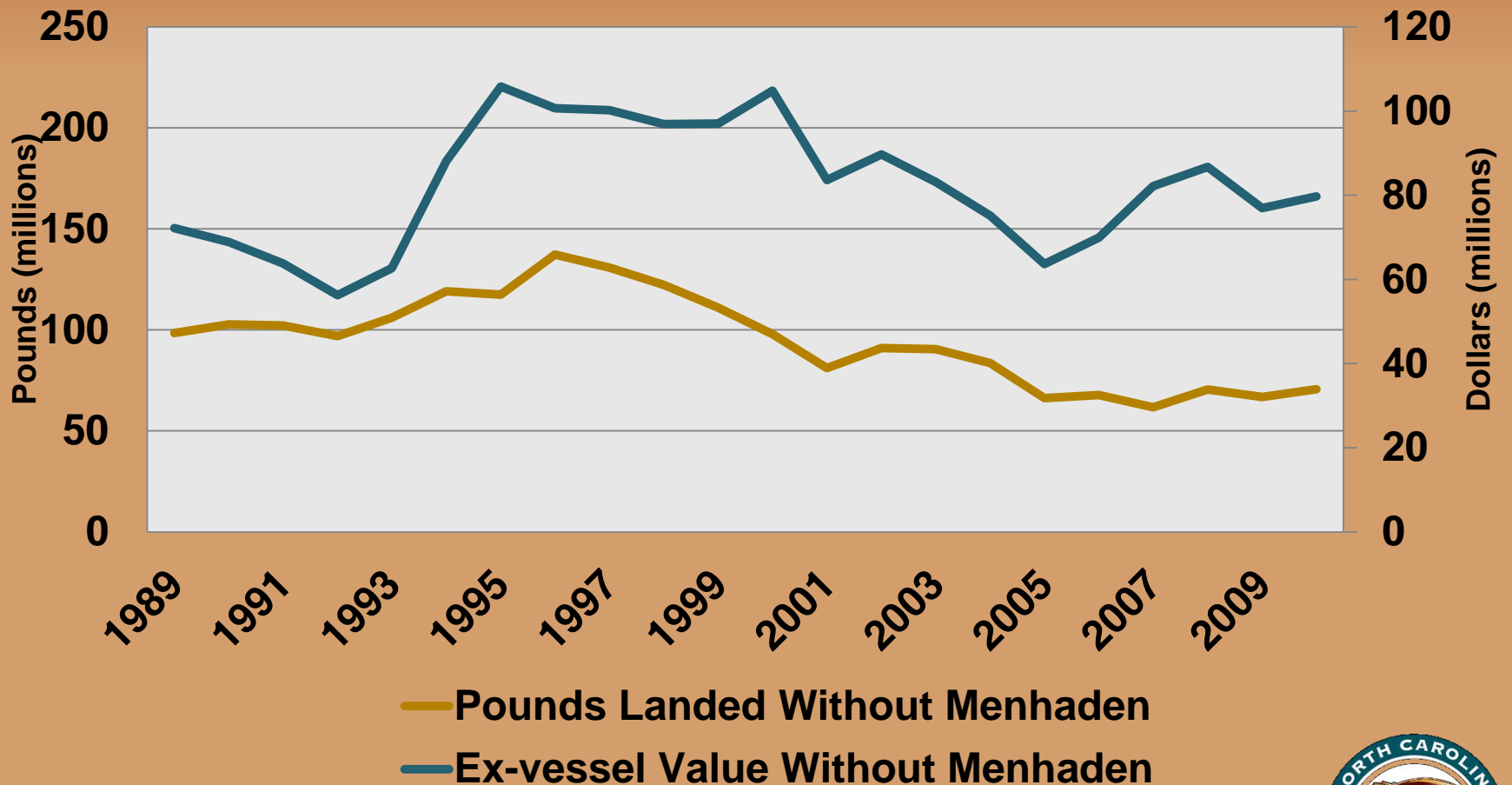


- **2.5 million acres of coastal waters**
- **4,000 miles of shoreline**
- **Second-largest estuary on East Coast**
- **39 important commercial and recreational species**
- **3,600 active commercial fishermen**
- **1.9 million recreational fishermen**
- **Ranks 2nd among East Coast states in number of fish landed recreationally**
- **Ranks 7th among East Coast states in pounds of fish landed commercially**

# Total Commercial Landings & Value

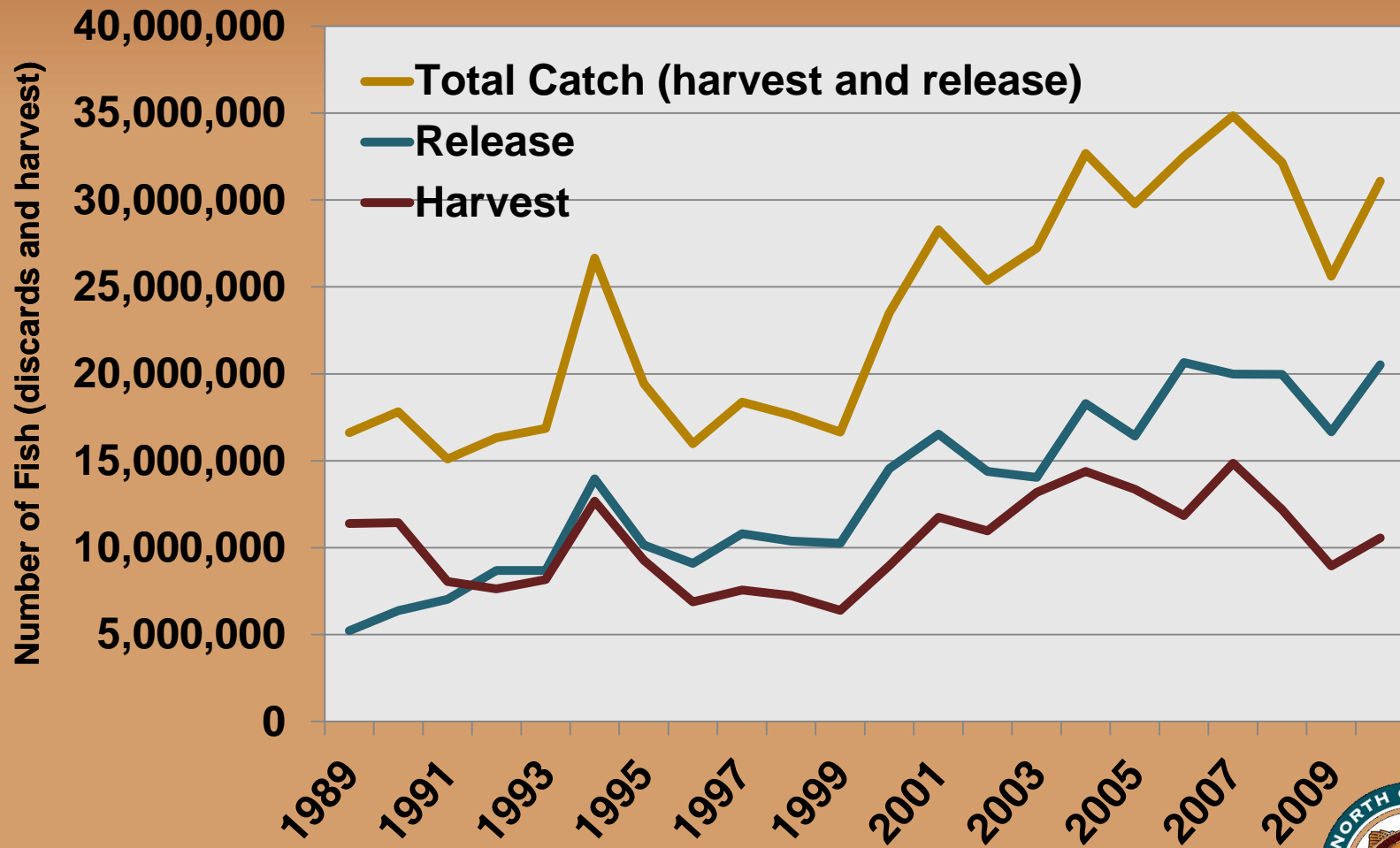


# Commercial Landings & Value Without Menhaden



# Recreational Landings 1989-2010

(number of fish all species)



# Commercial Economic Impact

Year	Imports excluded
2009	\$267,410,000
2008	\$304,923,000
2007	\$289,038,000
2006	\$464,977,000



# Recreational Economic Impact

<b>Year</b>	<b>Includes trip &amp; durable expenditures</b>
<b>2009</b>	<b>\$1,785,194,000</b>
<b>2008</b>	<b>\$2,291,227,000</b>
<b>2007</b>	<b>\$2,295,623,000</b>
<b>2006</b>	<b>\$2,515,467,000</b>



# Total Economic Impact

Year	Imports excluded
2009	\$2,052,604,000
2008	\$2,596,150,000
2007	\$2,584,661,000
2006	\$2,980,444,000





# **Fisheries Reform Act of 1997**

**(GS 143B-289.51)**

**Management of North Carolina's coastal fisheries is largely governed by this law, which revamped the state fisheries management process by:**

- Restructuring the Marine Fisheries Commission**
- Mandating Fishery Management Plans for significant species**
- Requiring the Coastal Habitat Protection Plan**
- Implementing a new license structure**



# Changes to FRA

- Requirement that fishery management plans achieve sustainable harvest
- Requirement that fishery management plans rebuild overfished stocks within 10 years
- Coastal Recreational Fishing License
  - Not part of the original FRA; it was a key component of the Moratorium Steering Committee recommendation
  - Created CRFL grant program



# Marine Fisheries Commission

**The N.C. Marine Fisheries Commission is a nine-member board, appointed by the governor, to set policy for the management of the state's marine fisheries.**



# MFC Make-up

- **Three commercial fishermen**
  - One must be a licensed dealer, processor or distributor
- **Three recreational fishermen**
  - One must be involved with the sports fishing industry
- **Two at-large**
- **One fisheries scientist**



# Commission Members

**Joe Shute**  
*Recreational  
Industry*



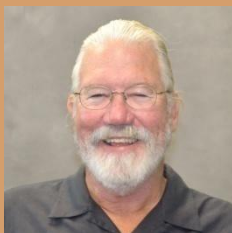
**Rob Bizzell**  
*Chairman  
At-large*



**Bradley Styron**  
*Commercial  
Fisherman*



**Chris Elkins**  
*Recreational  
Fisherman*



**Joseph J. Smith**  
*Commercial  
Industry*



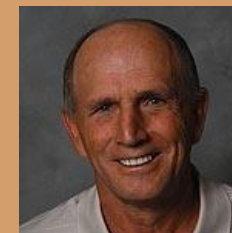
**Darrell  
Taylor**  
*Recreational  
Fisherman*



**Anna Beckwith**  
*At-large*



**Mikey Daniels**  
*Commercial  
Fisherman*



**Allyn Powell**  
*Scientist*





# **MFC Purpose**

**(G.S. 143B-289.51)**

- **Manage, restore, develop, cultivate, conserve, protect, and regulate the marine and estuarine resources**
- **Implement state laws relating to coastal fisheries by adoption of rules and policies**
- **Implement management measures regarding ocean and marine fisheries**
- **Advise the state regarding marine fisheries within the jurisdiction of regional and federal boards and councils**



# Shortlist of MFC Powers & Duties

(G.S. 143B-289.52)

- **Administer licenses and regulate time, seasons, size limits, trip limits, fishing methods and fishing gears**
- **Provide fair regulation of commercial and recreational fishing in the public interest**
- **Govern mariculture of shellfish and other marine resources on public grounds**
- **Adopt relevant federal laws and regulations as state rules**
- **Close waters to shellfishing for propagation**
- **Delegate to the fisheries director authority to suspend or implement a particular rule by proclamation**
- **Comment on permit applications affecting marine resources**
- **Adopt fishery management plans**
- **Approve the Coastal Habitat Protection Plan**
- **Establish advisory committees**





**The Division of Marine Fisheries is dedicated to ensuring sustainable marine and estuarine fisheries and habitats for the benefit and health of the people of North Carolina.**



# **N.C. Division of Marine Fisheries**

- **State agency responsible for management of North Carolina's coastal fisheries**
- **Collects and analyzes data necessary to recommend management actions to the Marine Fisheries Commission**
- **Implements rules and policies passed by the Marine Fisheries Commission**



# Division Structure

- **Housed under the N.C. Department of Environment and Natural Resources**
- **Director appointed by the governor**
  - **Works with, but not for the Marine Fisheries Commission**





# 10 DMF Sections

- **Administration**
- **Fisheries Management**
- **Resource Enhancement**
- **Marine Patrol**
- **License & Statistics**
- **Protected Resources**
- **Habitat Protection**
- **Shellfish Sanitation & Recreational Water Quality**
- **Administrative Services**
- **Maintenance Services**

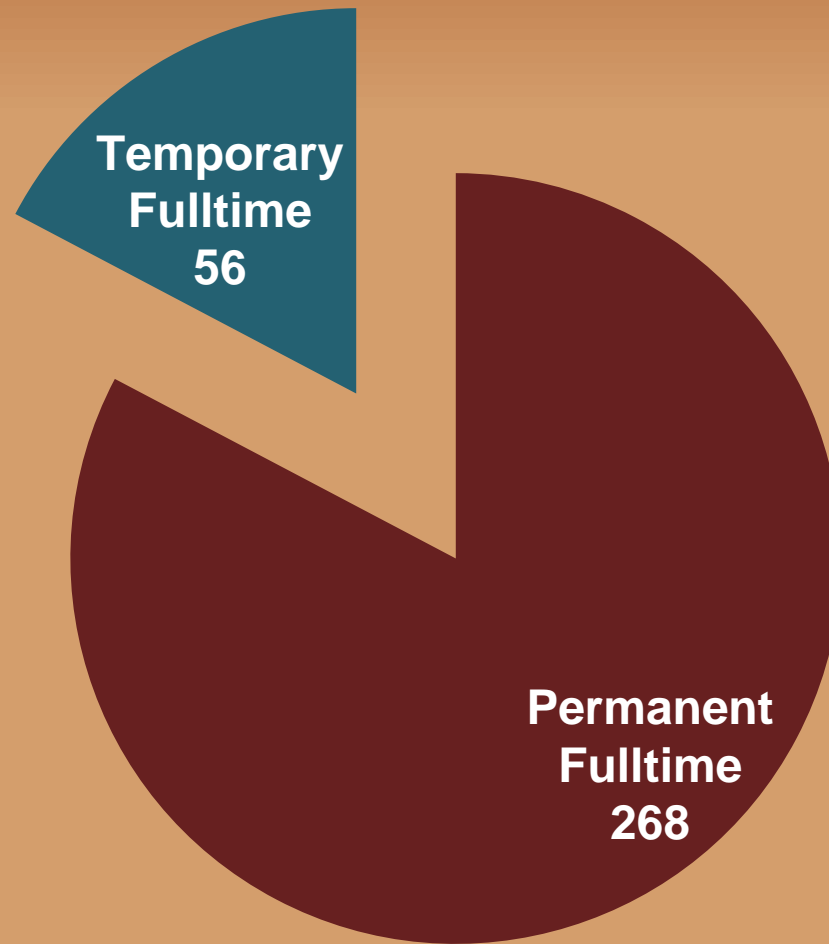


# Seven Offices

- **Morehead City – Headquarters**
- **Morehead City – Central District**
- **Wilmington – Southern District**
- **Washington – Pamlico District**
- **Elizabeth City – Northern District**
- **Manteo – Field Office**
- **Nags Head – Shellfish Lab**



# 324 Positions



# Staff Duties Include:

- Producing fishery management plans
- Selling fishing licenses and analyzing statistics
- Researching the stock status of species and recommending fisheries management actions
- Educating the public about fisheries issues
- Monitoring water quality for shellfish harvest and recreational activities
- Coordinating with other state, regional and federal fisheries authorities



# Staff Duties Include:



- Enforcing fisheries rules
- Building oyster sanctuaries, artificial reefs and other resource enhancement projects
- Monitoring protected species interactions
- Reviewing environmental permits
- Administering Coastal Recreational Fishing License grants
- Serve as lead staff for the Coastal Habitat Protection Plan





# Other Fisheries Agencies

- **N.C. Wildlife Resources Commission**
  - Responsible for inland fisheries management in North Carolina
- **Atlantic States Marine Fisheries Commission**
  - Federally mandated compact that coordinates fisheries management in state waters between the East Coast states



# Other Fisheries Agencies

- **National Marine Fisheries Service**
  - Federal agency that regulates ocean waters between three and 200 miles from shore.
- **South Atlantic Fishery Management Council**
  - Regional council that develop fishery management plans for federal waters, focusing on species primarily associated with waters south of Hatteras
- **Mid-Atlantic Fishery Management Council**
  - Regional council that develop fishery management plans for federal waters, focusing on species primarily associated with waters north of Hatteras



# Key Philosophy of Fisheries Reform Act

## The General Assembly

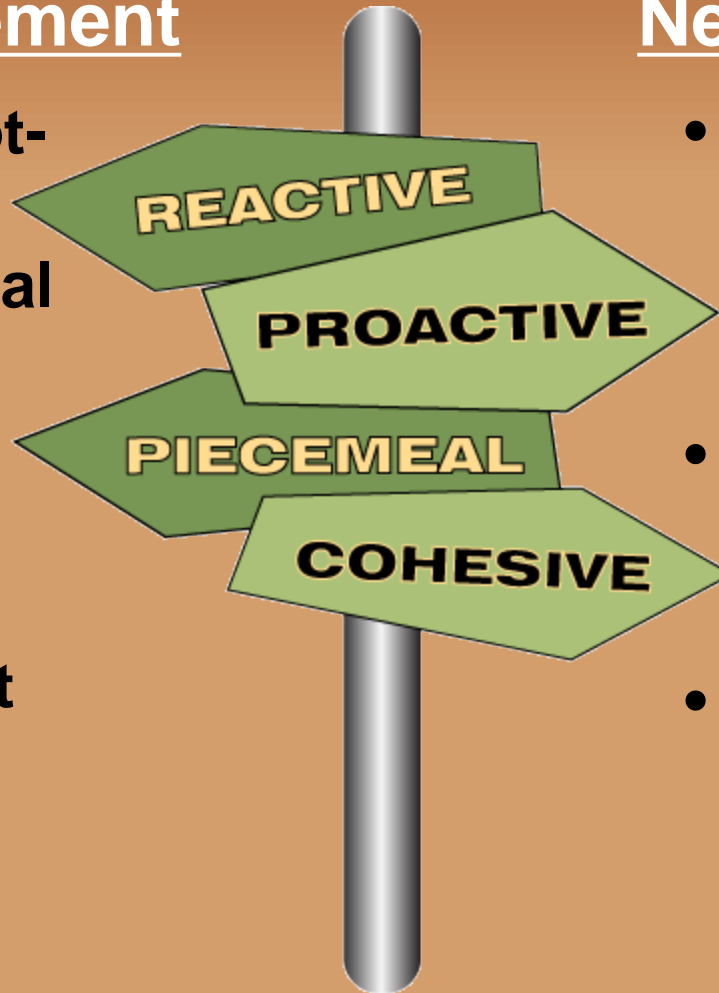
***“recognizes the need to protect our coastal fishery resources and to balance the commercial and recreational interests through better management of these resources.”***

**- S.L. 1997-400, H.B. 1097**



## Old Management

- Based on hot-topic issues and emotional outcries
- No formal criteria for planning or management decisions



## New Management

- Formal criteria for planning and management decisions
- Based on scientific analysis
- Structured system for public input



# **FRA Major Impacts**

- **Changed commercial licensing structure and increased license fees**
- **Created Recreational Commercial Gear License**
- **Reduced size and reorganized Marine Fisheries Commission**
- **Increased law enforcement civil penalties**
- **Set up stakeholder committees to advise the Marine Fisheries Commission**
- **Mandated fishery management plans**
- **Mandated Coastal Habitat Protection Plan**





# Impacts to DMF

## Revised the agency's mission:

***“The Division of Marine Fisheries is dedicated to ensuring sustainable marine and estuarine fisheries and habitats for the benefit and health of the people of North Carolina.”***

- **Makes management decisions based on sound data and objective analysis**
- **Views public participation as essential for successful fisheries management**
- **Enforces rules fairly and consistently**



# Programs Created/Enhanced

## Habitat Protection Section

- Coastal Habitat Protection Plan
- Strategic Habitat Areas

## Stock Assessment Program

- Stock Assessments
- Fishery Management Plans

## Socio-Economics Program

- Social and Economic Analysis



# Programs Created/Enhanced

## Oyster Restoration

- Shell recycling
- Reef construction
- Sanctuaries

## License Programs

- New commercial licenses
- Recreational Commercial Gear sales partnership with Wildlife Resources Commission

## Biological Sampling Programs

- Data collection for stock assessments, management plans, Coastal Habitat Protection Plan



# Coastal Habitat Protection Plan

- **Recognized that overfishing is not the only roadblock to sustainable harvest**
- **Documented ecological role of aquatic habitats for coastal fisheries**
- **Recommended management changes to improve coastal fisheries habitats**
- **Required multiple agencies and regulatory boards to work together to improve coastal fisheries habitats**



# **A Fishery Management Plan is:**

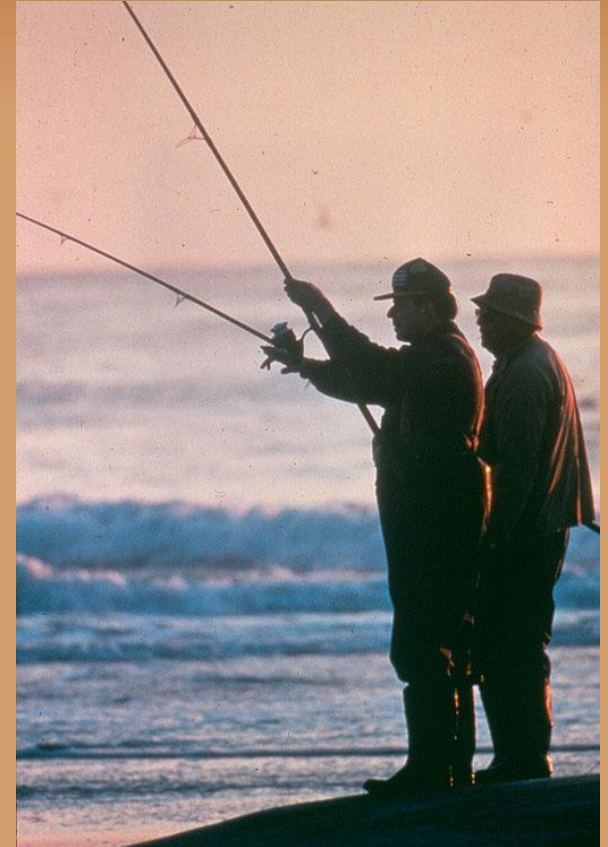
**A document that guides management of coastal fishery stocks with the goal of ensuring the long-term sustainability of those stocks**

- Division of Marine Fisheries develops with the aid of advisory committees**
- Marine Fisheries Commission adopts plan and management measures**



# Fishery Management Plans Include:

- **Stock assessment**
- **Characterization of the fishery**
- **Habitat considerations**
- **Identified issues & concerns**
- **Management strategies**





**Fishery management plans  
must achieve sustainable  
harvest within 10 years of  
adoption of the plan.**

**G.S. 113-182.1(6)**



# Public Input Opportunities

**Advisory Committee Meetings**



**Additional Public Meetings**



**MFC Meetings/Hearings**



**Joint Legislative Commission on Governmental  
Operations**



# Current MFC Advisory Committees:

## Regional

- Northeast
- Southeast
- Central
- Inland

## FMP

- Southern Flounder
- Spotted Seatrout
- Striped Bass
- Blue Crab
- Shrimp
- Striped Mullet

## Standing

- Finfish
- Shellfish
- Crustacean
- Habitat & Water Quality

## Subject Matter

- Strategic Habitat Areas
- Coastal Recreational Fishing License
- Sea Turtle



# N.C. FMPs

## Completed

- Southern Flounder
- Red Drum\*
- Oyster\*
- Hard Clam\*
- Interjurisdictional\*
- Kingfish
- Bay Scallop\*
- River Herring\*
- Shrimp
- Blue Crab\*
- Striped Bass
- Striped Mullet

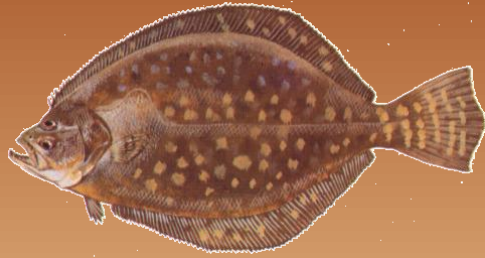
## In Progress

Spotted Seatrout  
Southern Flounder Amd. I  
Striped Bass Amd. I

Blue Crab Amd. 2  
Striped Mullet Review  
Shrimp Review

*\*Denotes plans that have completed amendments*





# Southern Flounder

Completed:  
**February 2005**

Amendment:  
**In process**

Initial Status:  
**Overfished (Depleted)**

Current Status:  
**Depleted**

## FMP Measures

- Increased size limit to 14 inches commercial, 15 inches recreational
- Implemented gear restrictions to reduce undersized discards

## Improvements

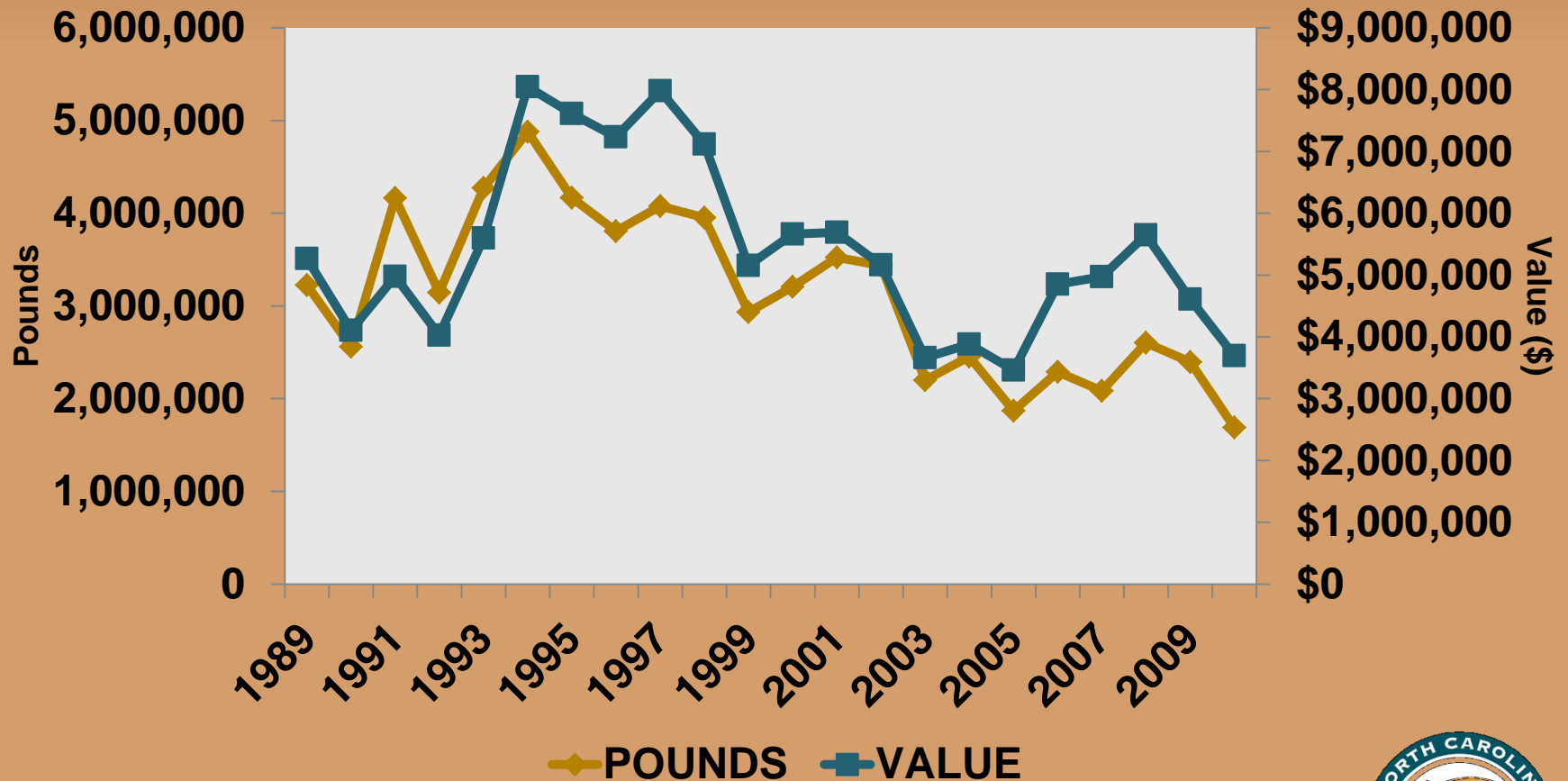
- Reduced fishing mortality
- Increased spawning stock
- Improved age structure

## Challenges

- Interactions with protected species
- Gauging the impact of sea turtle lawsuit settlement
  - 2009 stock assessment shows stock is overfished and overfishing is occurring

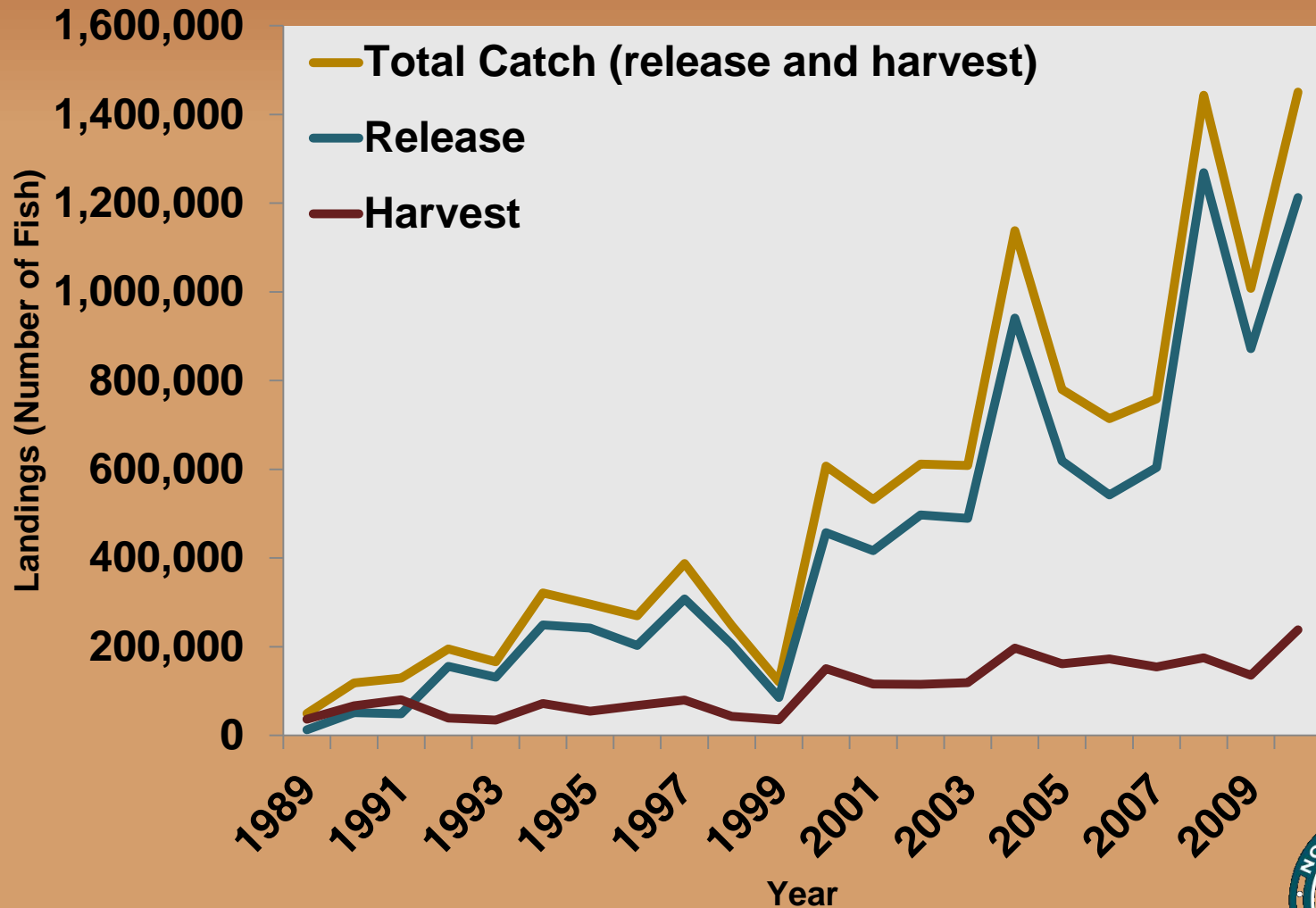


# Southern Flounder Commercial Landings & Value





# Recreational Southern Flounder Landings





## Red Drum

**Completed:**  
**March 2001**

**Amended:**  
**November 2008**

**Initial Status:**  
**Overfished**

**Current Status:**  
**Recovering**

### FMP Measures

- Reduced recreational bag limit from five fish to one
- Implemented commercial trip limit
- Prohibited harvest over 27 inches

### Improvements

- Two recent stock assessments show North Carolina has achieved a stock rebuilding goal set by ASMFC in 2002
  - N.C. DMF in 2007
  - ASMFC in 2009

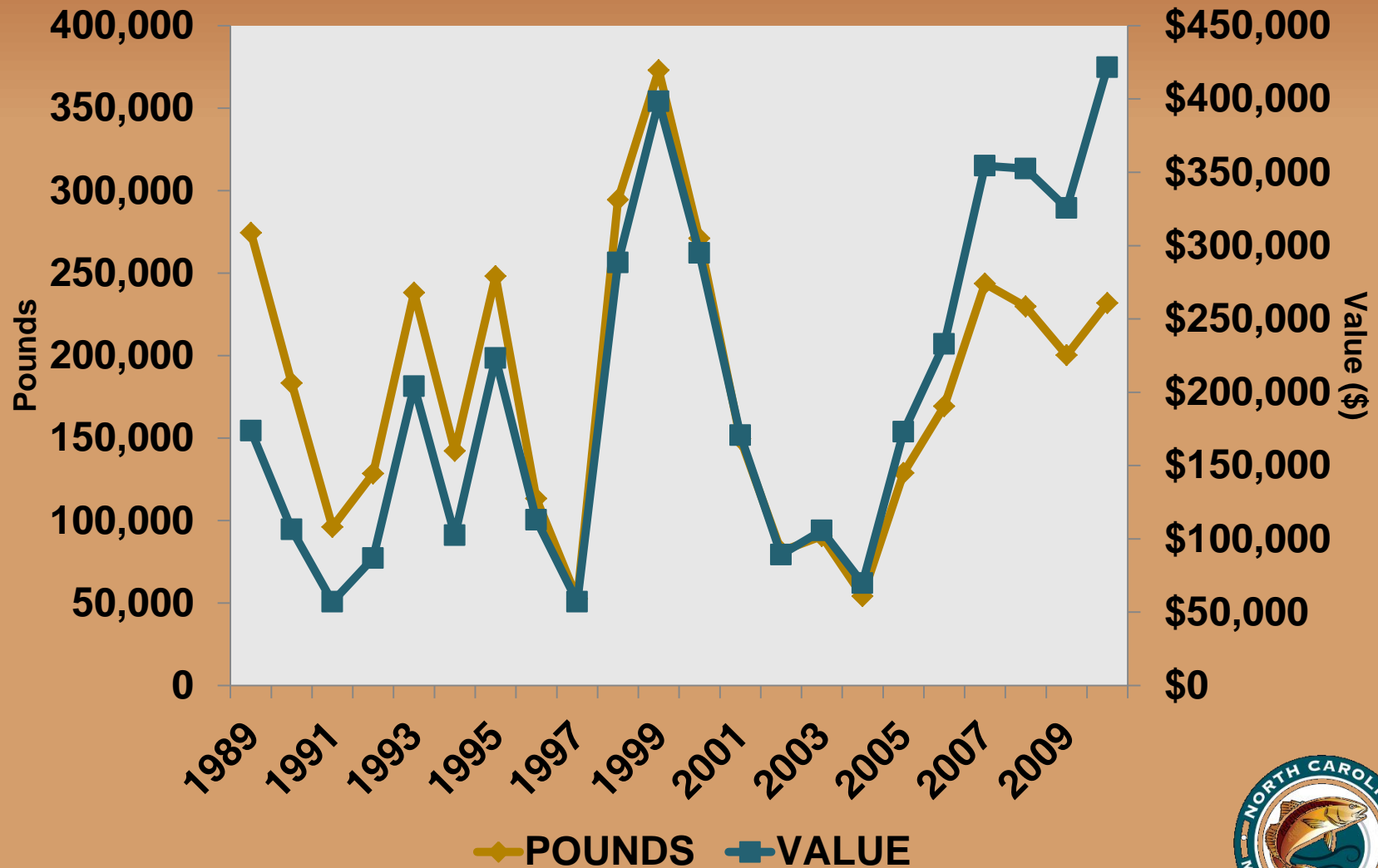
### Challenges

- Management of a long-lived, recovering stock

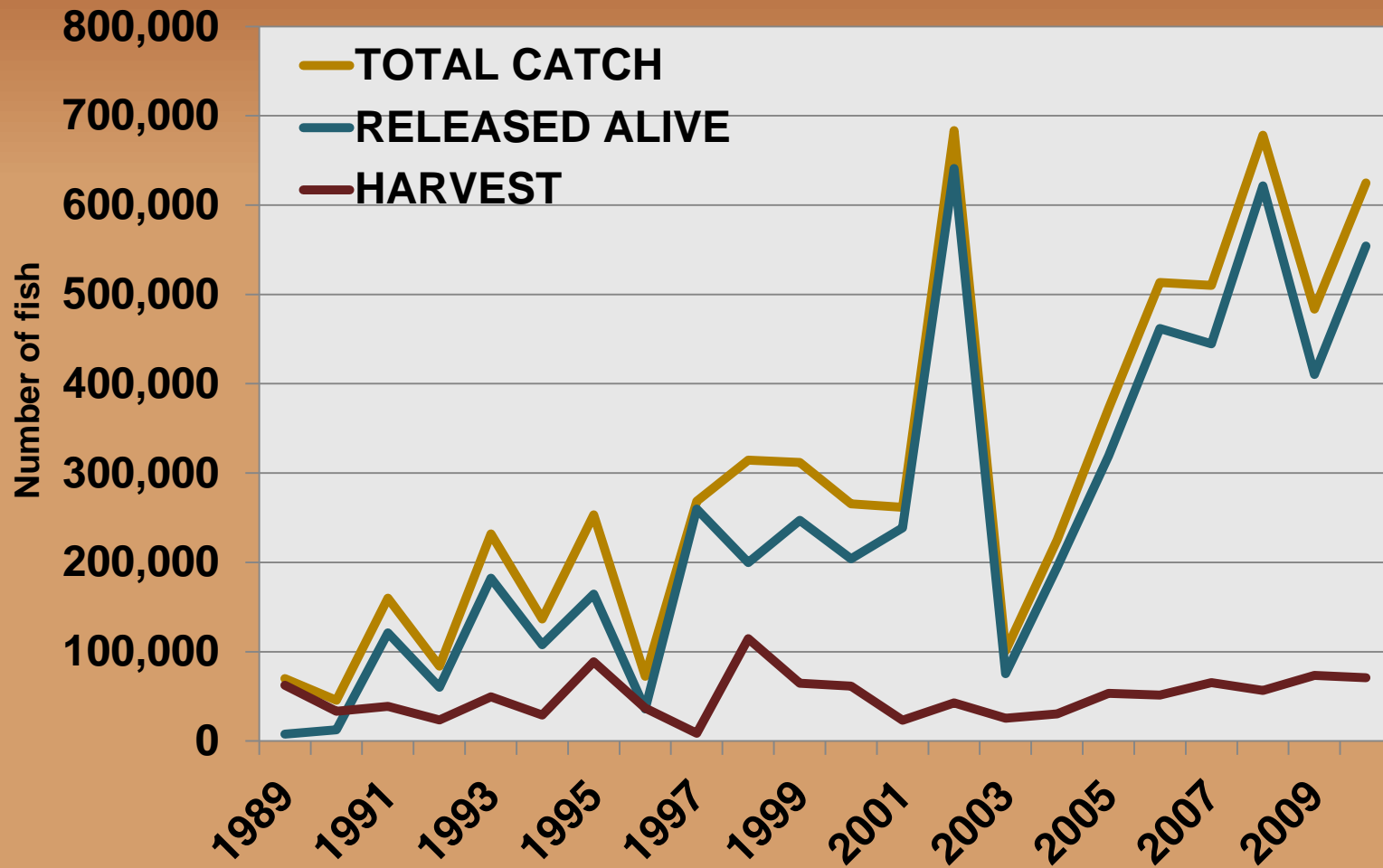


# Red Drum

## Commercial Landings and Value



# Recreational Red Drum Landings





# River Herring

**FMP Completed:**  
**February 2000**

**Amended:**  
**September 2007**

**Initial Status:**  
**Depleted/Unknown**  
(Albemarle Sound/Other Waters)

**Current Status:**  
**Depleted/Unknown**  
(Albemarle Sound/Other Waters)

## FMP Measures

- No-harvest provision
- Allows discretionary fishery for research purposes and to benefit cultural festival
- Funding for research
- Designation of Anadromous Fish Spawning Areas

## Improvements

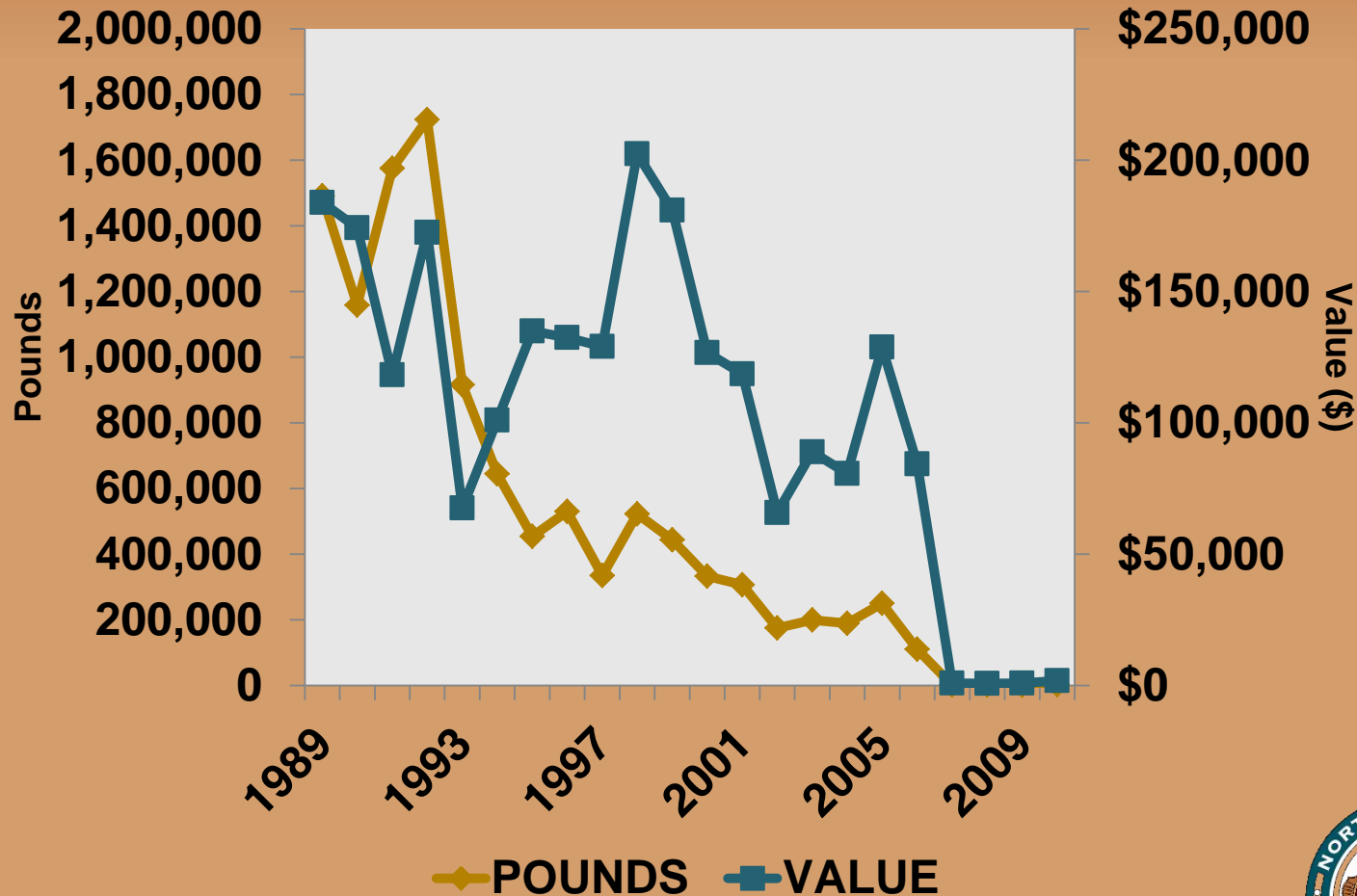
- Research (ASMA)
  - Spawning area survey, migration impediment survey, expanded juvenile sampling, commercial pound net survey

## Challenges

- Impacts from closure still unknown
- Unknown bycatch in ocean trawl fishery
- Impediments to spawning migration

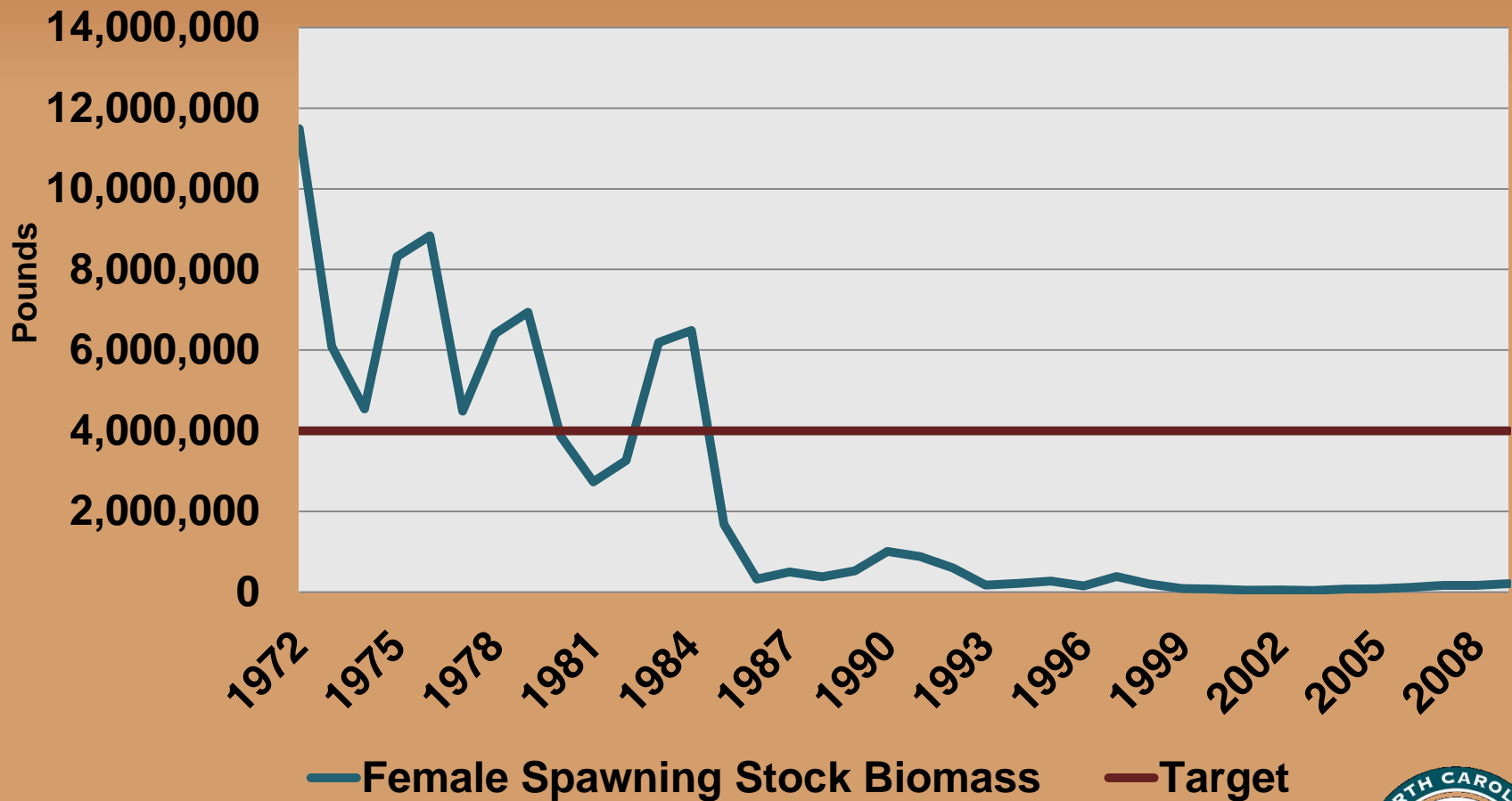


# River Herring Commercial Landings & Value





# Chowan River Blueback Herring Spawning Stock Biomass





## **Interjurisdictional (27 Species)**

**Completed:**  
**September 2002**

**Amended:**  
**June 2008**

**Initial Status:**  
**Varies by Species**

**Current Status:**  
**Varies by Species**

### **FMP Measures**

- **Adopted federal and interstate FMPs by reference to comply with state law**
- **Coordinated state efforts for participation in federal and interstate FMP processes**
- **Set forth public outreach procedures for federal and interstate issues**

### **Improvements**

- **Improved public participation**
- **Facilitated compliance with federal regulations**

### **Challenges**

- **Federal data deficiencies**
- **Federal legislation**
- **Parity for North Carolina**
- **Coordination with state FMPs**



# Conclusions

- **The mission of the Division of Marine Fisheries was developed from statutory requirements in the FRA.**
- **Requirements of the FRA have resulted in management decisions being more deliberative and based on sound data and analysis.**
- **Management decisions are made following one of the most open and public processes in state government.**



# Conclusions

- **The key to successful management under the FRA is to base management decisions on sound data and analysis.**
- **A healthy resource fairly and equitably benefits all user groups.**





# Equipment

- Large fleet of cars, trucks, vessels
- Three fixed wing aircraft
- One 135-foot landing craft
- Five self-propelled barges ranging from 32 feet to 60 feet
- One 44-foot research vessel
- One 48-foot (ocean-going) patrol vessel
- Seven dump trucks
- 10 frontend loaders
- One crane
- Four forklifts



# What Does a Stock Assessment Do?

- **Provides past and present stock status - Is the stock getting bigger or smaller?**
- **Makes predictions on a stock's response to management options**



# What does age structure tell us?

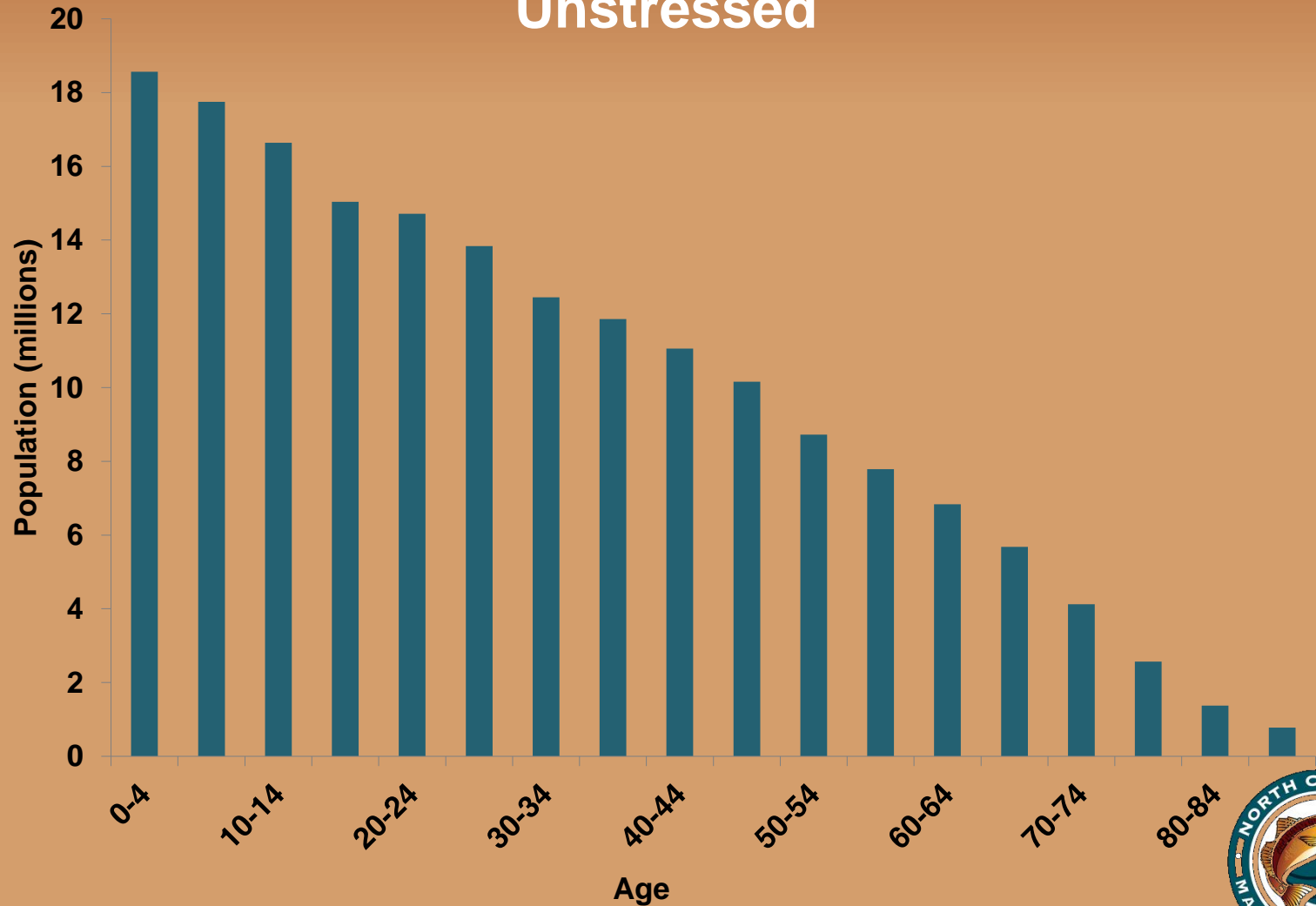
- **At what age the fish are harvested**
- **How long the fish live**
- **How many of what age make up the stock**



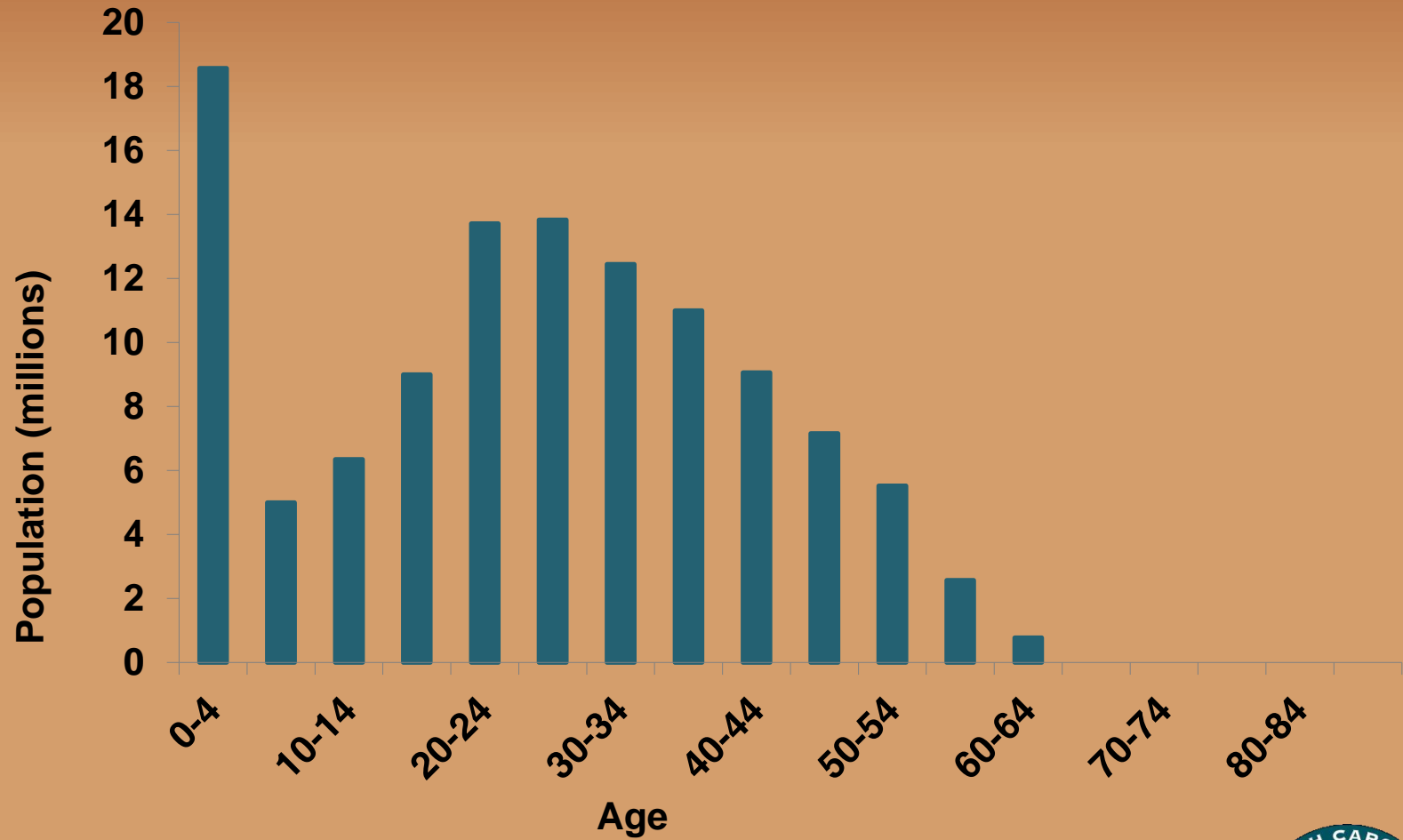


# Hypothetical Human Population

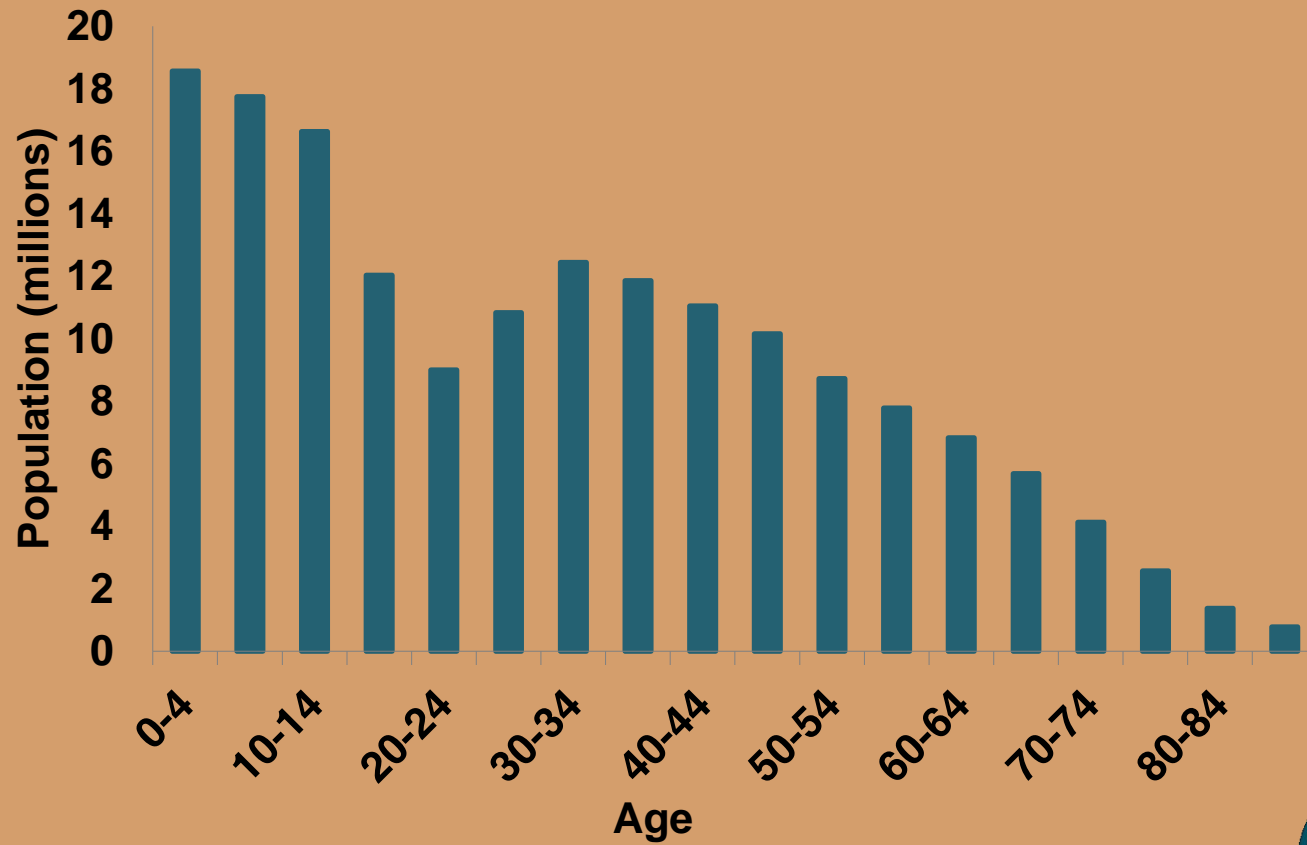
Unstressed



# Stressed



# At War



# What Is Mortality?

**Rate that fish die**

- **Fishing mortality = death from fishing**
  - Landings
  - Discards
- **Natural mortality = any other death**
  - Predation
  - Disease
  - Environmental
  - Old age



# Sustainable Resource

## \$50 Monthly Light Bill

<b>\$1,000 Principal (SSB)</b>	<b>5% Interest (F)</b>	<b>\$50 Earnings (Sustainable Harvest)</b>
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<b>\$800 Principal (Red Tide)</b>	<b>5% Interest</b>	<b>\$40 Earnings</b>
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**\$790 Principal**

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<b>\$800 Principal</b>	<b>8% Interest F Rebuilding</b>	<b>\$64 Earnings</b>
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**\$814 Principal**



# Uncertainty in Data Projections

**Arises from many sources**

- **Input data**
- **Model assumptions**
- **Environmental Influences**
- **Model Limitations**



